



Jeremiah W. (Jay) Nixon, Governor • Sara Parker Pauley, Director

## DEPARTMENT OF NATURAL RESOURCES

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**MAY 25 2016**

CERTIFIED MAIL: 7012 2920 0002 0660 9529  
RETURN RECEIPT REQUESTED

Mr. Paul Miller, P.E.  
City of Lee's Summit  
220 S.E. Green Street  
Lee's Summit, MO 64063

RE: City of Lee's Summit – Sanitary Sewer Design and Construction Manual, ACT178, Standard Sewer Specifications and Details Comments

Dear Mr. Miller:

The Department of Natural Resources' Water Protection Program has finalized the review of the Sanitary Sewer Design and Construction Manual received on April 22, 2016. We expect a response to the following requirements and recommendations below within 30 days receipt of this letter:

### **REQUIREMENTS:**

The following items are required to be in compliance with 10 CSR 20-8. The Sanitary Sewer Design and Construction Manual must be updated to incorporate the following requirements:

1. The city of Lee's Summit provided the Design Criteria of Section 6500 – Sanitary Sewers for department review. However, department staff located the city's Design and Construction Manual online at <http://cityofls.net/Development/Development-Regulations/Design-and-Construction-Manual>. In addition, the specifications referred to sections not found online by staff. Please include the following for a complete review of the city of Lee's Summit's standard specifications and details regarding sanitary sewers and pump stations:
  - a. Section 2100 – Grading and Site Preparation
  - b. Kansas City Metropolitan Chapter of the American Public Works Association Division II Section 2100
  - c. Section 3500 – Sanitary Sewers
  - d. Standard Details – Sanitary Sewers
  - e. Pump Station Facilities Design Criteria
  - f. Low-Pressure Sewer System Facilities Design Criteria
  - g. Wastewater Excess Flow Holding Basin Facilities Design Criteria

2. “Sewers 24 inches (61 cm) or less shall be laid with straight alignment between manholes. Straight alignment shall be checked by either using a laser beam or lamping”, per 10 CSR 20-8.120(5)(E)1. Include the requirement to check by laser beam or lamping.
3. Incorporate curvilinear alignment of sewers consistent with 10 CSR 20-8.120(5)(E)2.
4. “Ledge rock, boulders, and large stones shall be removed to provide a minimum clearance of 4 inches (10 cm) below and on each side of all pipe(s)”, per 10 CSR 20-8.120(5)(H)2.C. Include this requirement.
5. Per 10 CSR 20-8.120(5)(H)2.D., “[a]ll water entering the excavations or other parts of the work shall be removed until all the work has been completed. No sanitary sewer that ultimately arrives at existing pump stations or wastewater treatment facilities shall be used for the disposal of trench water.” Include the requirement that no trench water will enter a sanitary sewer.
6. Address the bedding, haunching, and initial backfill of rigid pipe, plastic pipe, and composite pipe according to 10 CSR 8.120(5)(H)3.A., 10 CSR 20-8.120(5)(H)3.C., and 10 CSR 20-8.120(5)(H)3.D. respectively.
7. “Debris, frozen material, large clods, stones, organic matter, or other unstable materials shall not be used for final backfill within 2 feet (0.6 m) of the top of the pipe”, per 10 CSR 8.120(5)(H)4.A. Include this requirement for final backfill.
8. “When using precast manholes, drop connections must not enter the manhole at a joint,” per 10 CSR 20-8.120(6)(B)3. Include this requirement for all drop type manholes.
9. Incorporate the bench requirements of manholes according to 10 CSR 20-8.120(6)(E).
10. “Precast manholes shall conform to the design and test methods specified in ASTM C478 and C497”, per 10 CSR 20-8.120(6)(F)1. Revise Page 6 of Section 3500 Part P.1. to include ASTM C497.
11. Per 10 CSR 20-8.120(8)(A)3, manholes shall be located so they do not interfere with the free discharge of flood flows of a stream. Specify this requirement with stream crossings.
12. Address the siltation and erosion with stream crossings including the seven day exposure requirement according to 10 CSR 20-8.120(8)(B)2.
13. “Precautions against freezing, such as insulation and increased slope, shall be provided. Expansion jointing shall be provided between above-ground and below-ground sewers”, per 10 CSR 20-8.120(9)(B). Provide the method(s) to prevent aerial pipe freezing and shearing.

14. 10 CSR 20-8.120(10)(C)1. provides the preferred deviation for horizontal sewer and water main separation. "Such a deviation may allow installation of the sewer closer to a water main, provided that the water main is in a separate trench or on an undisturbed earth shelf located on one side of the sewer and at an elevation so the bottom of the water main is at least 18 inches (46 cm) above the top of the sewer." Include this preferred deviation in Section 6500 Part 6501.E.1.c.
15. "If it is impossible to obtain proper horizontal and vertical separation as described above for sewers, the sewer must be constructed of slip-on or mechanical joint pipe or continuously encased and be pressure tested to 150 pounds per square inch (150 psi) (1,034 kPa) to assure water tightness", per 10 CSR-8.120(10)(C)1.B. Incorporate this requirement for the protection of water supplies.

**RECOMMENDATIONS:**

The department is providing the following recommendations to improve the provided standard specifications and details. These recommendations are not required actions, but will allow for a more well-rounded standard specifications and details.

1. For existing sewers and new service connections a saddle type connection should be used in accordance with 10 CSR 20-8.120(5)(I)2.
2. The Section 3500 include an air test for PVC and DIP gravity sewer mains, but does not include concrete pipe and the corresponding appropriate ASTMs according to 10 CSR 20-8.120(5)(I)5. The addition of concrete pipe air testing is recommended.
3. The provided specifications address vacuum testing of manholes, but do not provide the appropriate ASTM. ASTM C1244 is recommended in accordance with 10 CSR 20-8.120(6)(G)1.
4. The addition of the manhole exfiltration testing specified by ASTM C969 in accordance with 10 CSR 8.120(6)(G)2 is recommended.
5. Details can clearly demonstrate what the expectation is in certain instances often better than words. The following details are a suggested addition:
  - a. Concrete anchor;
  - b. Thrust block;
  - c. Typical gravity creek crossing; and
  - d. Typical aerial pipe crossing

**DEVIATION REQUESTS:**

The department may grant deviations when engineering justification is provided. Justification must be demonstrated in writing and through calculations that a variation from the design rule(s) will result in either at least equivalent or improved effectiveness.

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1. Page 14 of Section 6500 Part H.1.b. states, "Manholes shall be provided at intervals not exceeding 500 feet on all sewers." However, 10 CSR 20-8.120(6)(A)1.D. requires manholes to be installed at a distance not greater than 400 feet for sewers 15-inches or less. In order to grant this deviation, please submit justification that the city owns and operates cleaning equipment with the capability to reach 500 feet of sewer.

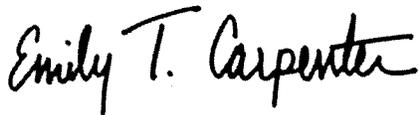
Construction, installation, expansion or modification of any collection system or wastewater treatment facility is prohibited until a construction permit is issued by the department, per 10 CSR 20-6.010(4)(A).

If you have any questions or if you would like to schedule a meeting to discuss this matter, please contact me at (573) 751-6569, [emily.carpenter@dnr.mo.gov](mailto:emily.carpenter@dnr.mo.gov), or Department of Natural Resources Water Protection Program, P.O. Box 176, Jefferson City, Missouri 65102. Thank you.

Any permit applicant may request an evaluation by the review engineer's direct supervisor, Ms. Cindy LePage, P.E., at 573-751-6618, or [cindy.lepage@dnr.mo.gov](mailto:cindy.lepage@dnr.mo.gov).

Sincerely,

WATER PROTECTION PROGRAM



Emily T. Carpenter, Construction Permit Unit  
Engineering Section

ETC:kv